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V. *An Abstract of the Meteorological Diaries, Communicated to the Royal Society, with Remarks upon them, by William Derham, D. D. Canon of Windsor, F. R. S.* [*Vide* PART IV. in *Transact.* N° 434.]

PART V. *Containing Meteorological Observations made at*

	Hall in Saxony, 1729.	
	Goslar	}
	Wittemberg	
	Naples	
	Southwick	
Sweden	Lunden	}
	Swenæker	
	Rifinge	
	Bettna	
	Upsale	
	Hudiskfwald	
	Hernœsand	
	Bygdea	}
		1728.

AN Abstract of *Meteorological Observations* made at *Hall* in *Saxony* in 1729, by *Joh. Joach. Langen*, Math. P. P. O. and in the Year 1728, at *Goslar* in *Lower Saxony* in *Germany*, by *Joh. Conrad. Trumphi*, M. D. & Pract. *Goslar*, at *Wittemberg* in *Saxony*, by *Joh. Fred. Weidler*, J. U. D. & Math. Super. Prof. in Acad. *Witteb.*

Witteb. at Naples, by *Nic. Cyrillus*, in *Urbe Neap.*
Pr. Med. Prof. at *Southwick*, in *Northamptonshire*,
 by *George Lynn*, Esq; and in *Sweden*, at *Lunden*,
Bettna, *Upsale*, and *Bygdea* (mentioned in 1726,) to which the illustrious Observers have added Observations from *Swenæker*, in *Westro-Gothia*, Latitude $58^{\circ} 10'$, by *Torstanus Vassenius*, V. D. Minist. in *Wassenda*; at *Wisingæ*, by *Magnus Oxelgren*, Lect. Gymnasii; at *Risinge* in *Ostro-Goth*, by *Sueno Laurelius*, Past. and Provost, at *Stockholm*, Lat. $59^{\circ} 30'$, by *Joh. Backman*, Citizen; at *Hudickswald Helsingorum*, by *Olave Broman*, Pastor there; at *Hernoesand* and *Angermann*, by *Jac. Renmarck*, Math. Lectore; at *Læfanger* and *Umea*, Lat. $63^{\circ} 43'$, by *Bern. Ask*, Theol. Stud. and at *Torneao*, in *Westro-Goth*. Lat. $65^{\circ} 43'$, by *Abr. Foug*, Pastor there. Extracted for the Use of the *Royal Society*, by *William Derham*, D. D. F. R. S.

A TABLE of the Highest, Mean, and Lowest Barometrical Stations, in the Year 1728.

	JANUARY.			FEBRUARY.			MARCH.		
	High	Mean	Low	High	Mean	Low	High	Mean	Low
Hall	29.4 $\frac{1}{2}$	28.7 $\frac{1}{2}$	28.1 $\frac{1}{2}$	29. 7	28.10	28. 2	29. 2	28.9 $\frac{1}{2}$	28. 5
Gollar							31. 3	30.10	30. 6
Wittemberg	30.2 $\frac{1}{2}$	29.5 $\frac{1}{4}$	28. 9	30.2 $\frac{7}{8}$	29. 9	29. 3	29.9 $\frac{7}{8}$	29. 5	29.1 $\frac{1}{4}$
Naples	29.88	29.50	29.12	29.88	29.71	29.54	29.88	29.65	29.38
Southwick	30.08	29.37	28.67	30.10	29.84	29.58	29.88	29.55	28.83
Lunden	30.20	29.46	28.72	30.22	29.52	28.82	29.81	29.16	28.51
Swenæker	30.36	29.68	29. 0	30.35	29.32	28.29	29.73	29.05	28.37
Risinge	30.20	29.55	28.90	30.20	29.52	28.85	29.67	29. 0	28.20
Bettna	30.80	30.10	29.40	30.80	30.12	29.45	30.21	29.55	28.90
Upsale	30.46	29.85	29.24	30.50	29.86	29.23	30.00	29.40	28.80
Hudickswald	30.50	29.75	29.01	30.56	29.89	29.22	30.24	29.52	28.80
Hernoesand	30.60	29.95	29.30	30.50	29.79	29.08	30.25	29.47	28.70
Bygdea.	30.50	29.75	29.20	30.40	29.67	28.94	30.28	25.39	28.50

The Barometrical Table continued.

	APRIL.			MAY.			JUNE.		
	High	Mean	Low	High	Mean	Low	High	Mean	Low
Hall	28.11	28.8	28.5	29.1 $\frac{1}{2}$	28.8	28.3 $\frac{1}{2}$	29.0 $\frac{1}{4}$	28.8	28.3
Goslar	31.4	30.11	30.6	31.5	31.0 $\frac{1}{2}$	30.8	31.4	31.0 $\frac{1}{2}$	30.9
Wittemberg	30.0	29.4 $\frac{1}{2}$	28.9	30.1	29.8	29.2 $\frac{1}{2}$	30.0	29.8 $\frac{1}{2}$	29.5
Naples	29.88	29.75	29.63	29.80	29.71	29.63	29.88	29.75	29.63
Southwick	29.94	29.48	29.03	29.96	29.51	29.07	29.93	29.70	29.27
Lunden	29.73	29.22	28.51	30.02	29.57	29.12	29.83	29.52	29.21
Swenæker	29.83	29.05	28.27	30.07	29.26	28.45	29.93	29.49	29.06
Riinge	29.70	29.06	28.43	29.95	29.35	28.75	29.70	29.35	29.00
Bettna	30.22	29.63	29.05	30.50	29.90	29.30	30.20	29.89	29.58
Upsale	30.00	29.49	28.98	30.29	29.73	29.17	30.09	29.73	29.38
Hudickswald	30.10	29.60	29.10	30.38	29.79	29.20	30.96	30.09	29.22
Hernœsfand	30.7	29.50	29.07	30.20	29.72	29.24	30.10	29.71	29.32
Bygdea	29.80	29.40	29.00	30.10	29.62	29.14	29.96	29.42	28.88

A Thermometrical Table of the Highest, Lowest, and Middle Stations at Naples, Southwick, Lunden and Upsale, in 1728.

	JANUARY.			FEBRUARY.			MARCH.		
	High	Mean	Low	High	Mean	Low	High	Mean	Low
Naples	49.05	43.5	38.5	48.0	44.5	35.0	39.5	35.9	32.3
Southwick	79.	67	55	80	67	54	69	57	45
Lunden	83	68	54	91	73	56	123	98	74
Upsale.	91.5	80.9	68.3	89.2	77.9	66.6	72.1	63.0	53.9

The Barometrical Table continued.

	JULY.			AUGUST.			SEPTEMBER.		
	High	Mean	Low	High	Mean	Low	High	Mean	Low
Hall	28.11	28.8	28.5	29.0	28.8½	28.5	29.1	28.10	28.8
Goslar	31.3	30.11	30.7	31.5	31.0	30.9½	31.5	31.0½	30.8
Wittemberg	30.¼	29.7	29.3½	30.½	29.8	29.4½	30.0	29.7½	29.3
Naples	29.80	29.71	29.63	29.88	29.80	29.72	29.88	29.54	29.21
Southwick	29.95	29.57	29.20	30.04	29.51	28.98	30.02	29.53	29.04
Lunden	29.73	29.38	29.02	29.92	29.37	28.82	29.91	29.45	29.00
Swenæker	30.10	29.19	28.28	29.74	29.19	28.64	29.93	29.39	28.86
Rifinge	29.50	29.15	28.80	29.57	28.86	28.15	29.95	29.32	28.70
Bettina	30.12	29.66	29.20	30.10	29.56	29.02	30.38	20.83	29.28
Upsale	29.91	29.55	29.20	29.91	29.45	29.00	30.17	29.71	29.25
Hudickswald	30.05	29.61	29.18	29.90	29.48	29.07	30.21	29.74	29.27
Hernœsfand	29.97	29.57	29.10						
Bygdea	29.85	29.42	29.00	29.96	29.58	29.20	30.2	29.53	29.05
Torneao				29.85	29.56	29.27	29.92	29.56	29.20

The Thermometrical Table continued.

	APRIL.			MAY.			JUNE.		
	High	Mean	Low	High	Mean	Low	High	Mean	Low
Naples	42.5	33.2	24.0	26.0	18.5	11.0	16.0	9.7	4.5
Southwick	71.0	53.	36	56	40	24	50	35	19
Lunden	148	118	85	172	145	118	176	153	130
Upsale	69.5	52.1	44.7	54.7	45.0	35.3	42.0	33.6	25.2

The Thermometrical Table continued.

	JULY.			AUGUST.			SEPTEMBER.		
	High	Mean	Low	High	Mean	Low	High	Mean	Low
Naples	13.5	8.2	3.0	16.0	10.0	4.0	26.5	17.1	7.7
Southwick	50	34	17	56	39	23	65	48	32
Lunden	172	152	132	153	133	113	150	122	94
Upsale	37.2	31.0	25.5	40.2	32.8	25.5	58.4	46.2	34.6

The

The Barometrical Table continued.

	OCTOBER.			NOVEMBER.			DECEMBER.		
	High	Mean	Low	High	Mean	Low	High	Mean	Low
Goslar	31. 5	31. 0	30. 6	31. 6	30. 5	30. 6	31. 8	31. 1	30. 4
Wittenberg	30. $\frac{1}{2}$	29. 6	29. 2	30. $\frac{1}{3}$	29. 0	28. 9	30. 2	29. 6	29. 1
Naples	29. 80	29. 71	29. 52	29. 96	29. 67	29. 38	29. 80	29. 51	29. 21
Southwick	29. 98	29. 31	28. 64	29. 95	29. 45	28. 91	30. 04	29. 42	28. 80
Lunden	30. 12	29. 51	28. 90	29. 90	29. 26	28. 62	29. 92	29. 32	28. 73
Swenæker	30. 26	29. 55	28. 84	29. 95	29. 14	28. 34	30. 16	29. 53	28. 91
Rifinge	30. 16	29. 43	28. 70	29. 80	29. 05	28. 30	30. 05	29. 42	28. 80
Bettua	30. 80	30. 02	29. 25	30. 40	29. 70	29. 01	30. 70	30. 11	29. 52
Upfale	30. 49	29. 83	29. 16	30. 10	29. 44	28. 79	30. 49	29. 87	29. 25
Hudickswald	30. 97	29. 99	29. 01	30. 22	29. 47	29. 72	30. 60	29. 95	29. 30
Bygdea	30. 40	29. 70	29. 0	30. 24	29. 42	28. 60	30. 50	29. 80	29. 10
Torneao	29. 90	29. 58	29. 25						

The Thermometrical Table continued.

	OCTOBER.			NOVEMBER.			DECEMBER.		
	High	Mean	Low	High	Mean	Low	High	Mean	Low
Naples	40. 0	31. 3	22. 5	48. 0	42. 0	34. 0	54. 5	54. 5	44. 7
Southwick	71	56	41	84	64	43	87	72	58
Lunden	119	98	78	109	87	64	83	71	59
Upfale	68. 2	58	47. 7	98. 0	57. 0	56. 1	89. 6	76. 8	64. 0

A Table of the Rain at Southwick and Naples in the Year 1728.

	Southwick		Naples			Southwick		Naples	
	Inch	Cent	Inch	Measures		Inch	Cent	Inch	Measures
Jan.	4.	00	4.	15 $\frac{1}{2}$	Jul.	3.	21	0.	00
Feb.	0.	99	0.	00	Aug.	0.	96	0.	00
Mar.	3.	27	0.	5	Sep.	0.	86	4.	4
Apr.	1.	97	0.	14	Oct.	2.	79	6.	17 $\frac{1}{2}$
May	1.	44	0.	00	Nov	1.	52	2.	7
Jun.	2.	82	1.	2 $\frac{1}{2}$	Dec.	2.	43	6.	8 $\frac{1}{2}$

*Rain in the whole Year,**At Southwick, is 26 Inches, and 26 Centesimals.**At Naples, is 19 Inches, and 14 Measures.**Remarks*

Remarks on the Meteorological Observations of the Year 1728.

As the Observations of this Year, which the *Royal Society* hath received from many, and very distant Parts of the World, are two large and numerous to be printed in the *Philosophical Transactions*, or read at the Society's Meetings; so to make them as useful as possible, I have put as many of them as I could into Tables, to be seen and compared at an easy View, as I have done in former Years: But I am forced to omit such of them, where no Account is given of the Instruments they used, or where none were made use of at all, but only verbal Descriptions given, that Tables would not admit of. But the Places mentioned in the Tables, had the Society's Glasses of Mr. *Haukesbee's* making.

The *Barometrical* Observations I need not satiate the Society with Remarks upon, because I have made divers of that Kind, upon the preceding Years: only I shall repeat two Things that I formerly took notice of, and have had frequent Confirmations of this Year; *viz.* 1. The great Conformity of the Ascents, Descents, and Stations of the Mercury in the Barometer. 2. That the Range of the Mercury is much greater in the Northerly than Southerly Climes.

As for the *Thermometrical* Observations, I have inserted all that were made with the *Royal Society's* Glasses: but such as were made with other Thermometers, it would have been of little or no use to have taken notice of them, unless I could have reduced them

to some known Measure ; which only two of the curious Observers enabled me to do ; but I found that a Matter so perplext and difficult, as not to answer the great Trouble of it, especially considering that these Tables exhibit Observations made in different and distant Parts, *viz. Italy, Germany, England, and Sweden*, by which an Estimate may be, in some measure, made of the Temperature of those different Climates of the World. In order to which, I must repeat what I mentioned in some preceding Year ; that in the *Royal Society's* Glasses, the Point of *Extream Heat* is 5 Degrees above 0, that *Temperature* is 45 Degrees below 0, and *Freezing* at 65 Degrees. And if we cast our Eye upon the several Months, particularly those of Winter, especially if we consider that which I have remark'd in 1727, from Dr. *Cyril*, concerning the *Freezing-Point* at *Naples* to be at 55 Degrees, which is at *London* at 65 Degrees, and at *Christiana* and *Bengal* probably as different also. I say, considering these Things, it is surprizing that the Heat and Cold of those distant Places, is not as different as their Northerly and Southerly Situations. But at *Lunden*, I was surprized to find the Thermometer much lower in the warmer Months than at *Upsale*, or any other of the *Swedish* places, 'till I found that in all those Months, they had continual Cold and Rain, when the other places mention little but Fair, or Cloudy, and but little Rain or Cold. And this minds me of a former Observation, *That Cold is the Parent of Wet*, especially in Summer.

As to the *Winds* and *Weather*, so many are the Places of Observation, and so many and so various the Observations, that its next to impossible to give
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a tolerable Abridgment of them: and therefore my Remarks on the foregoing Years, especially on the same Places* and Parts of the World, must suffice here.

The Quantity of *Rain* and *Snow* were observed at *Naples*, *Rising*, *Bettina*, *Upsale*, *Hudickswald*, and *Southwick*: but I find no Description of the Instruments wherewith they observed, nor of their Measures, except at *Southwick* and *Naples*, and therefore am forced to omit all but the two latter, in which the Depth is measured by *English* Measure, the *Southwick*, by Inches, and hundredth Parts of an Inch; and the *Naples*, by *English* Inches, and the Observer's Measures, ²³ of which make an *English* Inch.

Lastly, That I may omit as little as may be of what the illustrious Observers take notice of, I shall add the Meteors they mention, together with some of my own, that happened about the same Time.

The first was a *Lumen boreale* at *Bettina*, in the Night after *Mar. 20*; and at half an Hour after 8 on *Mar. 22*, at *Windsor*, I saw an unusual sort of *Streaming*, in which the Columns were not (as usually) conical, or pointed, nor rising towards the Zenith-point; but were with parallel Sides, and rose perpendicularly to the Horizon. They were very bright, emitting a Light equal to that of the Moon in her Quarters. Also they rose from a Bank of Vapours, not curved at Top (as usually) but lacinated, or broken.

Also on *Mar. 24*, the curious *Bettina* Observer saith, there was, the Night before, *Lumen Efflamans boreale*; which was also seen at *Læfanger*.

On *August 26*, at Night was a remarkable *Lumen boreale* at *Bettina*. And the Night before at 10 Hours

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* *Vide Transact. n. 433, p. 334. & seq.*

20 Minutes *p. m.* a Gentleman going from my House, saw towards the East, about 30 Degrees high, a *Ball of Fire*, about 4 Inches Diameter, blazing, and standing still at first, and presently after, it ran towards the North, and in about five, or more Minutes, he heard an Explosion like Thunder. Its Blaze emitted a Light equal to that of the Moon at Full.

At the same Time, the News-papers say, a *Light* in the Sky, like a Comet, was seen at *Watford* in *Hertfordshire*, with Sparks of Fire issuing from its Tail; that then it brake out with a prodigious Lustre, like the Sun, which lasted not long, and was followed with a terrible Clap of Thunder, the Stars twinkling all the while, and not a Cloud to be seen. Which Clap, I doubt not, was the same which my Friend heard, and which was five or more Minutes in its Passage hither.

At *Bettna*, *Lumina borealia* were seen on the Nights after *Sep. 18, 19, and 24*; the second of which covered half the Heavens. And on *Sep. 21*, about 10 Hours *p. m.* I observed, at *Upminster*; an unusual sort of Tan-coloured thick Vapours towards the N.W.b.N. but withal lightsome, and such as the Stars might be seen through. And after some Time, they sent forth, in divers Places, *Streaming Lances*, gently and gradually coming and going.

On *Oct. 13*, I saw that uncommon sort of *Streaming* at *Redbridge*, near *Southampton*, the Account of which is printed in *Philos. Trans.* No. 410, and the same Night at *Bettna* was *Lumen boreale eruptans Flammam*, as the Observer expresses it. At *Læfanger* also those Streamings were on the same Night, and on the 15th, 18th, 19th, and 23^d.

On

On Oct. 19th, a *Parbelius* was at *Lunden*, and on the 22^d a *Lumen boreale* at *Wittemberge*.

On Nov. 12th, at *Windfor*, we had considerable *Streaming*; and the same was at *Bettna* and *Umea*; and on the 29th at *Læfanger*; and again at *Umea* on Dec. 24.

An APPENDIX to the Remarks on 1728, and some of the Years preceeding it.

After I had finished the foregoing Observations on the Year 1728, I received the curious Observations of the illustrious *Marquiss Poleni*, made at *Padua*, * for six Years; such of which as are conformable to mine, I shall subjoin by way of Appendix.

The first Thing he gives an Account of is, the *Quantity of Rain and Snow* (in *English Measure*, and according to the Old Stile) that fell before and after this Year 1728, in six Years Time, in the following Table.

A Table of the Rain at Padua, in the Years

	1725	1726	1727	1728	1729	1730
	Inch Dec.	Inch Dec.	Inch Dec.	Inch Dec.	Inch Dec.	Inch Dec.
Janu.	0. 521	1. 355	5. 955	4. 278	1. 085	0. 112
Febr.		1. 460	1. 073	1. 050	1. 245	2. 906
March	0. 889	3. 168	1. 878	4. 832	2. 902	4. 592
April	4. 019	3. 998	0. 498	1. 419	2. 768	1. 638
May	3. 625	1. 368	3. 530	3. 403	2. 634	4. 467
June	0. 036	2. 608	2. 476	2. 103	3. 134	6. 205
July	2. 297	2. 357	2. 930	4. 016	4. 526	2. 339
August	5. 185	1. 268	5. 067	5. 186	0. 578	4. 269
Sept.	2. 647	2. 900	4. 164	6. 948	3. 267	1. 090
Octob.	7. 104	0. 179	6. 576	5. 163	6. 294	5. 254
Nov.	3. 636	2. 277	5. 091	6. 836	4. 186	0. 534
Dec.	0. 030	2. 390	7. 169	7. 599	2. 804	0. 894
Year	29.989	25.328	46.407	52.833	35.423	34.300

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From

* *Vide Transact. n. 421, p. 201, & seq.*

From this Table he observes, that the *Februaries* were the driest *Months*, and 1726, the driest *Year* in all the Six, and that the *Octobers* were the wettest *Months*, and 1728 the *wettest* of all the six Years.

Further also he saith, that in the four *Seasons* of the Years (reckoning their beginning from the 10th Day of their respective Months, *viz.* of *December, March, June* and *September*; that I say) less Wet falls in Winter and Spring, than in Summer and Autumn, and that the wet Weather increases, as the Seasons advance; that in Winter is the least Wet; that it increaseth in Spring; is more in Summer; and most of all in Autumn.

For the Proof of this, he hath made a Table of the mean Quantities of the Rain in the four Seasons of each of the six Years; the Sums of which six Years Rain, are in Winter, 39.490 Inches; in Spring, 52.188 Inches; in Summer, 58.25 Inches; and in the Autumn, 74.558 Inches. But in the many Years that I observed the Weather at *Upminster*, I find it not so.

After these Observations of the Weather, the illustrious *Marquis* proceeds to the *Barometrical Indications* of it; and hath made Tables of the Rising and Falling of the Quicksilver, together with the Coast of the Winds, both against Rain, and also against Snow, hoping to predict from thence the several sorts of Weather. But I omit the Tables, because I think little of general use can be concluded from them but what is commonly known.

I omit also his Table * of the Sum and Mean Altitudes of the Barometer, and Thermometer; but his following Table may be of use. A T A.

* *Vide Transact. n. 421, p. 210.*

A TABLE of the Higheſt and Loweſt Station of the Barometer, with the Winds and Weather in the

Year	Month	Day O. S.	Barometer Higheſt	Barometer Loweſt	Winds	Weather at the ſame Time
1725	Janu.	19	30.28		W	Fair.
	Dec.	8		28.56	SW 4	Cloudy.
1726	Nov.	28	30.18		N	Fair.
	Feb.	13		28.92	SW	Cloudy.
1727	Nov.	20	30.24		NW	Fair.
	Octob.	29		28.80	S 2	Cloudy.
1728	Dec.	2	30.20		N	Thin Clouds.
	Dec.	12		29.00	NW	Small Rain.
1729	Dec.	20	30.30		W	Somewhat Cloudy.
	Nov.	10		28.90	N	Rain.
1730	Dec.	20	30.40		N	Fair.
	Feb.	27		28.98	SE	Sunſhine with Cloudy

From this Table it appears, from the Higheſt and Loweſt Stations in the fix Years, that the greateſt Range of the Barometer, is 1.84 Inches; but at *Naples*, it is only 94 Centefimals of an Inch; and what it was at other Places, I have given ſome Account of in my Remarks on 1727.

The illuſtrious Obſerver hath alſo been very curious, and ſedulous in his Obſervations of the *Thermometer*; which I am ſorry I can give no acceptable Account of, for want of ſo much Knowledge of his Thermometer, as may enable me to compare his Obſervations with mine.

He hath alſo compared with his own, the Quantities of *Rain*, and the *Barometrical Range* obſerved at *Paris*, by *M. de la Hire*; and finds that the

Paris

Paris Rain is $16.4\frac{1}{2}$ Lines, and the *Barometrical Range* $2\frac{1}{2}$ Lines more than the *Padua*.

The last Thing which the illustrious *Marquiss* takes notice of is the *Magnetical Declination*, which he saith is 13 Degrees *West*, and hath decreased in the six Years $\frac{1}{60}$ th; that every Day there is a small Alteration in the Declination, so that it doth not continue the same a whole Day together; that the Declination of all needles (especially if touched by different Magnets) is different a few Sexagesims. But these Niceties I recommend to the Enquiry of the Curious, because they disagree with the Observations of *Gilbert*, and most of the *Magnetical Writers*.

F I N I S.

E R R A T A.

N U M B. 428, p. 85. l. 4. r. *Bottarius*. n. 429 p. 143 l. 19. r. *I was shewed*. n. 430, p. 157. l. 5. from the Bottom, r. *manet*. *ibid.* p. 191. l. 3. r. *de polythalamis*. n. 434. p. 415. l. 8. from the Bottom, r. *Rerum*.